

**plurality of permanent magnets**

located around a central core and secured against centrifugal force by a non-magnetic outer sleeve. Preferably, such magnet assemblies are formed as a unit that can be assembled onto the turbocharger shaft by retaining an annular arrangement of motor magnets in an assembly between central and outer sleeves.

In a preferred embodiment of the invention, the magnets can be secured around the central sleeve and within the retaining sleeve by a high-temperature structural adhesive, and the retaining sleeve can include inwardly projecting portions at its ends for an engagement with the ends of the magnets. Such a magnet assembly can be removably mounted on the turbocharger shaft between the turbocharger bearings and clamped in place by the axial force exerted on its ends by shaft sleeves when a rotor lock nut is tightened. The central core of the magnet assembly may be formed with a plurality of planar magnet-locating surfaces and ends, having a reduced surface area to reduce heat transfer to the magnets. In preferred magnet assemblies the inside surface of the central sleeve may be relieved in its central portion to reduce the area of contact with the turbocharger shaft, and reduce the heat flow from the shaft into the magnet assembly. In addition, in the turbocharger-electric motor assembly, or in the magnet assembly itself, insulating material may be placed between the central sleeve of the magnet assembly and the turbocharger shaft to limit heat



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**[54] MAGNET ASSEMBLIES FOR MOTOR-ASSISTED TURBOCHARGERS**
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**[52] U.S. Cl.:** 60/607; 310/156

**[58] Field of Search:** 60/607, 608; 310/61, 310/156, 262, 271; 415/115, 177; 416/95, 244 A, 244 R

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**[57] ABSTRACT**

An integral turbocharger-electric motor assembly permits the elements of an operating electric motor and turbocharger to be easily assembled into a relatively compact and reliable operating unit. To act as an electric motor rotor, the turbocharger shaft carries a magnet assembly in its central portion between the shaft bearings, in such proximity to the stator windings to provide electromagnetic coupling for the effective conversion of electric energy applied to the stator winding into rotational force applied by the magnet assembly to the turbocharger shaft. The magnet assembly includes a plurality of permanent magnets located around a central core and secured against centrifugal forces on a non-magnetic outer sleeve. Such magnet assemblies are preferably formed as a unit that can be assembled onto the turbocharger shaft by retaining an annular arrangement of motor magnets in an assembly between central and outer sleeves.

22 Claims, 4 Drawing Sheets

